REMARKS

Upon entry of the amendment set forth in Applicants' June 29, 2006 reply, claims 5, 6, 8, 12, 14-15, and 17-24 are pending in the application. Claims 5, 6, 8, 10, 12, 14-15, and 17-24 are rejected under 35 U.S.C. § 112, first paragraph[1] and claims 5, 6, 8, 10, 12, 15, 17, and 19-24 are rejected under 35 U.S.C. § 102.

As an initial matter, Applicants thank Examiner Sullivan for the helpful personal interview conducted on November 15, 2006 with Applicants' representative, James DeCamp. Applicants address the rejections set forth in the January 26, 2006 Office Action and the matters discussed in the November 15th interview as follows.

Claim Amendments

In addition to the amendments set forth in Applicants' June 29, 2006 reply, claims 5, 8, and 14 have been amended to recite a granulocyte-colony stimulating factor receptor deficient in amino acid residues 5 (Glu) through 195 (Leu) of *murine* wild-type granulocyte-colony stimulating factor receptor, or a granulocyte-colony stimulating factor receptor deficient in amino acid residues 5 (Glu) through 195 (Leu) and amino acid residues 725 through 756 of wild-type *murine* granulocyte-colony stimulating factor receptor.

Applicants submit that in view of the description of the sequence of the murine G-

[1] Applicants note that, in the Advisory Action mailed on July 20, 2006, claim 12 is not included in the § 112, first paragraph rejection, but the Advisory Action also does not indicate that this basis for rejection of claim 12 has been withdrawn.

CSF receptor sequence in Fukunaga et al. (Cell 61:341-350, 1990; copy enclosed as Exhibit A) one skilled in the art would have recognized that the amino acid residues recited in the claim refer to the wild-type murine sequence. The present amendment contains no new matter.

The present amendments were made solely to expedite prosecution and Applicants reserve the right to pursue canceled subject matter in this or in a continuing application.

Rejection under 35 U.S.C. § 112, first paragraph

Claims 5, 6, 8, 10, 12, 14, 15, and 17-24 stand rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement[2]. In particular, the Office asserts (page 3 and page 7 of the January 26, 2006 final Office Action; emphasis original):

> [T]he claims are directed to a genus of nucleic acid structures (i.e., vector molecules) encoding fusion proteins comprising deletion of *any portion* of the G-CSFR [granulocyte-colony stimulating factor receptor] extra-cellular domain where said truncated G-CSFR must correspond to proliferation activity.
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> * * *
>
> In the instant case, Applicant describes a single species comprising a fusion protein of the G-CSFR extracellular domain deleted. Therefore, the disclosure does not describe additional fusion proteins where there are deletions. In sharp contrast, the genus encompasses thousands of possibilities, with no clear guidance in the disclosure or in the art, as to any common feature or characteristic that will correspond to proliferation activity, irrespective of the location, combination or number of deletion(s).

Applicants submit that the claims, as amended, are free of this basis for rejection.

[2] Applicants note that claim 10 was canceled in Applicants' November 4, 2005 reply.

The claims as amended require the G-CSFR portion of the fusion protein encoded by the vector to include a granulocyte-colony stimulating factor receptor (claim 8), or a granulocyte-colony stimulating factor receptor deficient in amino acid residues 5 (Glu) through 195 (Leu) of wild-type *murine* granulocyte-colony stimulating factor receptor, or a granulocyte-colony stimulating factor receptor deficient in amino acid residues 5 (Glu) through 195 (Leu) and amino acid residues 725 through 756 of wild-type *murine* granulocyte-colony stimulating factor receptor (claims 5, 8, and 14). As such, the claims are not directed to "any portion" of the G-CSFR, but to specific portions recited in the specification as filed.

As noted in Applicants' June 29, 2006 reply, the specification, for instance in Example 1, describes constructing a chimeric protein including "the entire G-CSF receptor" and the ligand binding domain of the estrogen receptor ("GCRER") (see e.g., page 9, lines 12-14). As such, a fusion protein having a first polypeptide including a ligand binding domain of a steroid hormone receptor and a second polypeptide including a granulocyte-colony stimulating factor receptor ("GCR") is described in the specification as filed.

In further support of this assertion, Applicants direct the Office's attention to the enclosed copy of a Declaration by Dr. Yasuji Ueda submitted in connection with a reply to an Office Action in co-pending application serial number 09/142,305. Dr. Ueda is a co-inventor of the presently claimed invention and states (paragraph 2):

> G-CSF receptors are a class of proteins that were extraordinarily well characterized at the time the application was filed. The structural features,

> including the Immunoglobulin-like domain, the cytokine receptor homologous domain, the three fibronectin type III domains, and the intracellular domain, defining this class of receptors were also known. For instance, Fukunaga et al. (Cell 61:341-350, 1990; copy enclosed as Exhibit A) describes the murine G-CSF receptor sequence and notes that the sequence is highly homologous to that of the human G-CSF receptor. Larsen et al. (J. Exp. Med. 172:1559-1570, 1990; copy enclosed as Exhibit B) describes the human G-CSF receptor sequence. In addition, Fukunaga et al. (EMBO J.:10:2855-2865, 1991; copy enclosed as Exhibit C) describes functional domains of human and mouse G-CSF receptors. In view of the knowledge in the art at the time the application was filed, a skilled artisan would readily recognize a G-CSF receptor sequence.

Furthermore, Applicants submit that known sequences need not be included in the specification to meet the written description requirement of 35 U.S.C. § 112, first paragraph. As noted in Applicants' June 29, 2006 reply, the Federal Circuit has indicated that § 112 does not impose a *per se* rule requiring recitation in the specification of the nucleotide sequence of claimed DNA, when that sequence is already known in the field. *Capon v. Eshhar,* 418 F.3d 1349, 76 U.S.P.Q. 1078 (Fed. Cir. 2005). The Federal Circuit, in reversing the Board's conclusion that the written description requirement necessitated a listing of the specific nucleotide sequences of the claimed DNA, stated:

> The chimeric genes here at issue are prepared from known DNA sequences of known function. The Board's requirement that these sequences must be analyzed and reported in the specification does not add descriptive substance. The Board erred in holding that the specifications do not meet the written description requirement because they do not reiterate the structure or formula or chemical name for the nucleotide sequences of the claimed chimeric genes. (Emphasis added.)

Capon, 418 F.3d at 1358.

In addition, in *Falkner v. Inglis*, 448 F.3d 1357, 79 U.S.P.Q.2d 1001 (Fed. Cir. 2006) the Federal Circuit stated:

> [W]e hold that where, as in this case, accessible literature sources clearly provided, as of the relevant date, genes and their nucleotide sequences ... satisfaction of the written description requirement does not require either the recitation or incorporation by reference (where permitted) of such genes and sequences. (Emphasis added.)

Falkner, 79 U.S.P.Q.2d at 1008.

In the present case, G-CSF receptor sequences were known at the time the application was filed. As stated by the Federal Circuit, these sequences need not be recited in the specification to meet the written description requirement.

Turning to the particular G-CSF receptor fragments recited in the claims, Applicants submit that these fragments are adequately described in the specification as filed. For example, at page 9, lines 16-20, the specification teaches construction of a mutant of the GCRER fusion protein that is deficient in the 5th residue, Glu, through the 195th residue, Leu, of the murine granulocyte-colony stimulating factor receptor ("GCRΔ(5-195)/ER"). Further, for example, at page 9, lines 21-24, the specification describes a GCRER fusion protein that, in addition to lacking residues 5-195, lacks residues 725-756 ("GCRΔ(5-195, 725-756)/ER") of the murine G-CSF receptor. Accordingly, the specification as filed also describes fusion proteins having a first polypeptide including a ligand binding domain of a steroid hormone receptor and either a granulocyte-colony stimulating factor receptor deficient in amino acid residues 5 (Glu) through 195 (Leu) of wild-type murine granulocyte-colony stimulating factor receptor ("GCRΔ(5-195)"), or a granulocyte-colony stimulating factor receptor deficient in amino acid residues 5 (Glu) through 195 (Leu) and amino acid residues 725 through 756 of

wild-type murine granulocyte-colony stimulating factor receptor ("GCRΔ(5-195, 725-756)").

For all the above reasons, there can be no question that one skilled in the art would recognize that Applicants, at the time of filing, were in possession of the fusion proteins encompassed by the present claims. The written description rejection of claims 5, 6, 8, 12, 14, 15, and 17-24 should be withdrawn.

Rejection under 35 U.S.C. § 102(e)

Claims 5, 6, 8, 10, 12, 15, 17, and 19-24 are rejected under 35 U.S.C. § 102(e) as being anticipated by Capon et al. (U.S. Patent Number 5,838,544; "the '544 patent")[3]. The Office, at page 12, asserts that "Capon's teachings is deemed sufficient to envisage a fusion construct encoding a fusion protein comprising [a] ligand binding domain of a steroid hormone [receptor] and a proliferation domain of G-CSF[R]." Applicants disagree. To expedite prosecution, claims 5 and 14 have been amended to recite that the second polypeptide includes a granulocyte-colony stimulating factor receptor deficient in amino acid residues 5 (Glu) through 195 (Leu) of wild-type *murine* granulocyte-colony stimulating factor receptor, or a granulocyte-colony stimulating factor receptor deficient in amino acid residues 5 (Glu) through 195 (Leu) and amino acid residues 725 through 756 of wild-type *murine* granulocyte-colony stimulating factor receptor.

To anticipate a claim, each and every element set forth in the claim must be found,

[3] Applicants note that claim 10 was canceled in Applicants' November 4, 2005 reply.

either expressly or inherently, in a single prior art reference. The '544 patent does not describe a granulocyte-colony stimulating factor receptor deficient in residues 5-195 or residues 5-195 and 725-756 of wild-type murine granulocyte-colony stimulating factor receptor, much less a fusion protein containing such granulocyte-colony stimulating factor receptor portions. Consequently, the '544 patent fails to describe all of the elements of claims 5 and 14, as amended. The anticipation rejection of claims 5 and 14, as amended, and their dependent claims, should be withdrawn.

Applicants submit that claim 8 is also free of the anticipation rejection over the '544 patent. In particular, as noted in Applicants' June 29, 2006 reply, claim 8 is directed to a vector including both a desired exogenous gene and a gene encoding a fusion protein. The '544 patent fails to describe a single vector that includes an exogenous gene as well as a gene encoding a fusion protein. Accordingly, the '544 patent does not describe all of the elements of claim 8 and, therefore, cannot anticipate this claim. The § 102 rejection of claim 8, and its dependent claims, should be withdrawn.

CONCLUSION

Applicants submit that the application is now in condition for allowance, and this action is hereby respectfully requested.

Enclosed are a Petition to extend the period for submitting an Appeal Brief pursuant to the Notice of Appeal filed on July 27, 2006 for five (5) months, to and including February 27, 2007 and a check in payment of the required extension fee.

If there are any additional charges or any credits, please apply them to Deposit Account No. 03-2095.

Respectfully submitted,

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